

## ABSTRACT OF THE DISCLOSURE

A method and apparatus for synthesizing high-frequency signals, such as wireless communication signals, includes a phase-locked loop (PLL) frequency synthesizer with a variable capacitance voltage controlled oscillator (VCO) that has a discretely variable capacitance in conjunction with a continuously variable capacitance. The discretely variable capacitance may provide coarse tuning adjustment of the variable capacitance to compensate for capacitor and inductor tolerances and to adjust the output frequency to be near the desired frequency output. The continuously variable capacitance may provide a fine tuning adjustment of the variable capacitance to focus the output frequency to match precisely the desired frequency output. During fine tuning adjustment, the PLL may include an analog control loop in which a phase detector circuit and sample and hold circuit are utilized. The output of the sample and hold circuit may be provided to the PLL VCO as VCO input control signals.